

# S.1 Exploring Probability

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10:36 AM

pg 302

Explore - Sasha's game is not fair

Theoretical probability

		Player 2		
X		1	2	3
1		1	2	3
2		2	4	6
3		3	6	9

circle the winner

		Player 1		
+		1	2	3
1		2	3	4
2		3	4	5
3		4	5	6

$$\frac{3 \text{ wins}}{9} = 0.3\bar{3} \rightarrow 33\%$$

$$\frac{5 \text{ wins}}{9}$$

Change #'s on slips of paper to 4, 5, 6

X	4	5	6
4	16	20	24
5	20	25	30
6	24	30	36

circle winners

+	4	5	6
4	8	9	10
5	9	10	11
6	10	11	12

$\Rightarrow$  very unfair!

Experimental Probability:

- experiment to collect data

$$P(A) = \frac{n(A)}{n(T)}$$

$P(A)$  = probability that event A happens

$n(A)$  = the # of times A occurred

$n(T)$  = # of trials or the # of times you did the experiment.

### Theoretical Probability

- no experiment, think through all possible outcomes → put in table?

$$P(A) = \frac{n(A)}{n(S)}$$

$n(S)$  = ~~total~~ # of possible outcomes in the sample space

- can write probabilities as a fraction, decimal or percent.

- probability ranges from 0 (impossible) to 1 (certain)  
or 0% to 100%

Fair - all players are equally likely to win  
(equal probability to win)

Practice pg 303 # 1-4  
create a "fair" game (different)